Introduction

Often considered to be one of Sub-Saharan Africa's richer countries, Ghana's maternal mortality statistics tell a different story. Ghana has a high maternal mortality rate, estimated to be 560 per 100 000 live births (Ansong-Tornui et al 2007) –to place this statistic in some context, the maternal mortality rate of the UK is just 8 per 100 000 live births (WHOSIS, data for 2005). Despite over 20 years of safe motherhood initiatives, Ghana's health facility utilization rates remain low and huge national disparities exist. The Demographic and Health Surveys for 1993, 1998 and 2003 found that the richest quintile had increased its use of skilled birth attendants from 85 to 90%, whilst amongst the poorest the rate had actually declined from 25% to 19% in the same period (Witter et al 2007). There is also regional variation, with low service use and high mortality rates concentrated in the north of the country (Witter et al 2007).

In September 2003 a policy to grant fee exemption in health facilities was introduced. The implicit aim of the policy was to reduce the financial barriers to service access that many women faced, particularly for the poorest members of society. By removing fees for the poorest members of society, it was hoped that access would become more equitable, and improve Ghana's maternal mortality ratio by increasing the number of women delivering in a health facility with a skilled birth attendant. Ghana's 4 poorest regions (Northern, Upper East, Upper West and Central) were selected to be the primary recipients of the fee exemption policy, as here poverty rates were higher and utilization rates much lower than the remaining 6 regions of the country.

This paper will look at how has the fee exemption policy affected maternal health service utilisation in Ghana and whether or not it achieved its aim of increasing access amongst the poor. Previous research on Ghana's fee exemption policy shows that the policy made great initial leaps forward in increasing utilization of health services, however cite inadequate funding and poor organization, as being responsible for the downfall of the scheme. (see Penfold et al 2007, Asante et al 2007, Mills et al 2008,Witter and Adjei 2007 and Witter 2007) However these studies have only analyzed the impact at a relatively small level – usually district and regional. None of the studies as yet has taken a broader, national focus on the effect of the policy, as this paper will. Additionally, many of these studies use MICS data (2006), or DHS data (2003) – the data set this paper will use is the Ghana Maternal Health Survey (GMHS) and was only released during 2009, so has not been part of these earlier analyses.

Data and Methodology

The GMHS collected data from households and individual women to produce Ghana's first nationally representative picture of maternal health. The research objectives do not require the entire dataset to be used – instead only women who had at least one birth since 2002 were selected, reducing the dataset to a subsample of 5034 women. Several new variables were created by recoding the existing data. Information on the type of attendant at birth was recoded into 'skilled birth attendant' and 'unskilled birth attendant' using the WHO/UNFPA/World Bank definitions where a doctor, nurse, midwife or auxiliary midwife are considered to be skilled birth attendants, TBAs, regardless of whether they are identified as being 'trained', are not included. A variable for Institutional births was created by grouping births in both private and government facilities, which includes hospitals, mission facilities,

clinics and maternity homes. In order to counteract the biases created by small numbers of cases in statistical modeling, the regions were condensed into those that received the policy (Central, Northern, Upper East and Upper West) and those that did not (Greater Accra, Eastern, Western, Volta, Ashanti, Brong Ahafo). A variable to denote socio-economic status was also derived via the principal component analysis statistical method. In the GMHS there are a series of questions on household assets and characteristics. Using these as a proxy measure, a principal component analysis (PCA) can be produced to create a poverty variable. Capturing living standards through measuring durable asset ownership and housing infrastructure is also thought to be a reliable measure, as they are easily observable by the interviewer and will minimize measurement error from recall or social desirability biases (Howe et al 2008). Separate indices were constructed for rural and urban populations, as the nature of asset ownership as a measure of wealth is likely to differ between these populations. In order to classify the first component into wealth groups, cut off points were created at each 20% increment, which produced a set of wealth quintiles for the rural areas, and another for urban. To examine the relationship between health facility utilization and the explanatory variables, binary logistic regression modeling was used, as the dependant variable has a dichotomous outcome – those that gave birth in a health facility and those that did not – and the predictor variables are both categorical and continuous (for example, region as an example of the former and parity the latter) The variables to be included in the model, and the order of their imputation, was decided based upon information gathered during the literature review (the variables that other research projects found to be of importance would be included in the analysis), and through model building procedures. The data set was capped to only include births earlier than 2005. This is to reduce the possibility of contamination of the results by other maternal health strategies – the NHIS began to be introduced in late 2005. By restricting the regression model to contain only the births in the period of funding, it will hopefully give a truer estimate of the effects of the policy.

Results

In the 4 regions that received the fee exemptions, rates begin to rise in 2003 and the upward trend continues until 2005, increasing by 12.3% to almost 60%. At this same time, the regions that did not receive the fee exemptions exhibit a steady decline in institutional births. Declining from 70.1% in 2002, at 2003 the figure stands at 66.9% and continues its steady decrease to 59.1% in 2007. This may suggest the policy had a positive impact, as this steady decline was not noted in the regions that received the policy, instead projecting a clear upward trend beginning from 2003 (see Fig 1). In the 4 policy regions, all experience an increase in institutional birthing, though there is variation in the extent and duration of the increases. Central and Upper East respond the most dramatically, with the percentage in Upper East more than doubling in 1 year (from 32.1% to 67.2%) A common theme is that the dramatic increases are all relatively short term, and do not seem to be sustained beyond one or two years, with 2004 and 2005 marking the start of most declines.

Figure 1. Institutional Birth rates by grouped region

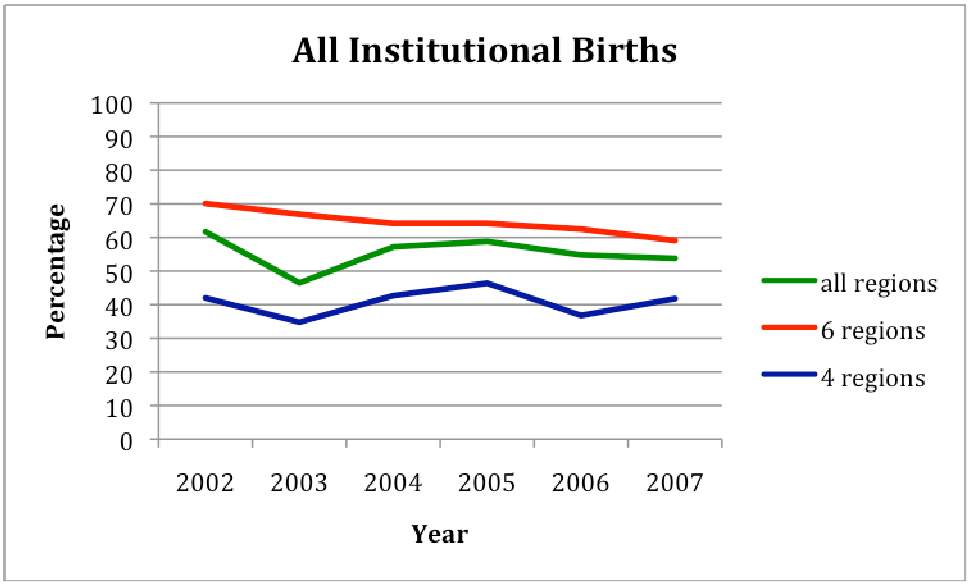
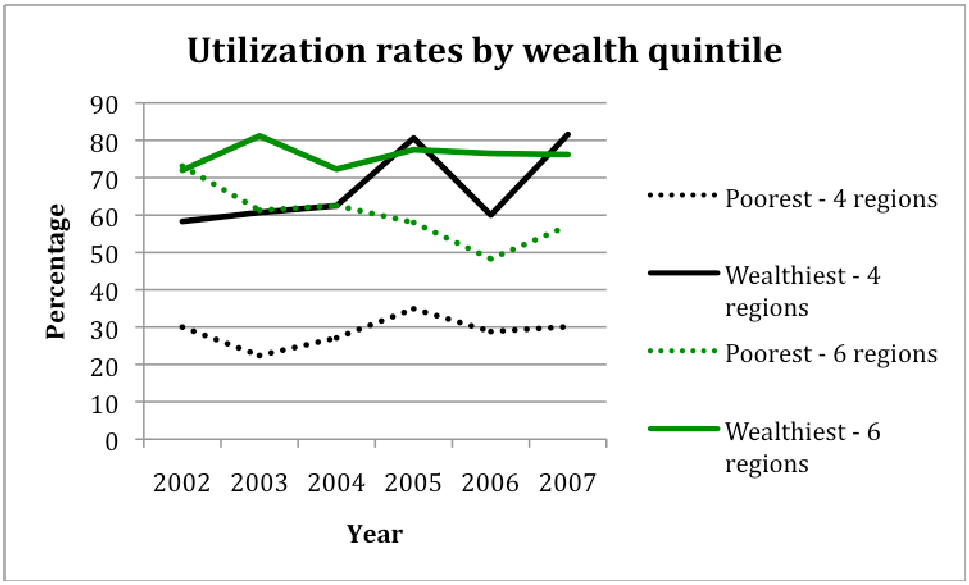


Figure 2. Utilization rates by wealth quintile



There are increases in both wealth groupings in the policy receiving regions (see Fig 2) – rising from 22.4% in 2003 to 34.9% in 2005 for the poorer women, around a 50% increase. For the wealthier women in the 4 policy regions, their utilization rates are already increasing before the policy start date, but between 2003 and 2005, utilization increases by almost 20%, peaking at 80.6%. This is higher than the utilization rates amongst rich women in the 6 non-policy regions, which are generally wealthier and more urban. The poorest women in the 6 non-policy regions fare the worst: a continual decline from 2002 to 2006 means utilization rates go from 73.1% to 48.3% in just 4 years.

The exploratory data shows increases in utilization across regions, wealth quintiles and education groupings for women who were living in areas that had the fee exemption, and these trends are more notable when compared to regions that did not receive the fee exemption policy. The regions that received the fee exemption policy avoided the downward trend in the percentage of deliveries at health facilities that affected the remaining 6 regions.

A comparison between births before and post trial implementation shows there are changes in pre and post delivery services too – the number of women reaching the WHO recommended target of at least 4 antenatal visits increased by over 10% in the policy regions. Postnatal check ups showed a very slight increase despite the fact postnatal care is not included in the fee exemption package. Regression modeling showed that being more educated and being wealthier all increase ones odds of delivering in a health facility. An interaction between place of residence and timing of the birth showed statistical significance ($p=0.05$), suggesting that the policy did affect women's odds of delivering in a health facility.

Conclusions

The results from the analysis of the GMHS 2007 concur with those produced in previous studies. The fee exemption policy had a positive effect on utilisation rates in the regions that received it in 2003, and this trend was evident in wealth and education subgroups – with particularly notable increases in the poor and those with no education. However increases in utilisation were short-term, a reversal in attendance was noted. These returns to lower rates coincided with the cessation of the policy in 2005, which is when funding began to run out. This connection is not necessarily spurious – at the introduction of the policy, rates increase; at its ending, rates decrease. To confirm this theory, the regression model predicts the interaction between timing and place to be of statistical significance – therefore, odds ratios for use increase when the policy is running in regions chosen for initial targeting. Just as the presence of a policy has had an affect on maternal health service utilisation, the lack of a policy has also had an effect. We can see in regions with no policy in place, rates of institutional births and skilled birth attendants are both in decline. The policy may also have encouraged people to remain involved with the health system throughout their pregnancies – the policy regions saw a huge increase in the number of women attending multiple pre-natal sessions, and there was even a slight increase in postnatal care, despite the fact this was not included as part of the fee exemption package. The logic behind the policy was that removing financial restrictions would open up the service to more women, and indeed, regions with the policy did see an increased in use amongst the poor. However, huge disparities still exist between these two groups.

Whilst Ghana's fee exemption has now evolved into an insurance-based system (the NHIS), there is still a fair argument to be made for fee exemption. The policy increased utilization rates in the 4 regions, when nationally the figure was stagnating at best. The key message is that affordable healthcare, particularly for those who are most financially vulnerable, is a necessity to avoid population marginalization and health inequalities.